What is claimed are:

1. A method of calibrating a bone mineral density index, comprising the steps of:

(a) obtaining an image in which an object and a phantom having regions of at least two different thickness are radiographed at the same time;

(b) calculating the bone mineral density index of the object and the average gray level in the each region of the phantom from the radiographed image;

(c) repeating the steps (a) and (b) N times to extract a correlation equation between the bone mineral density index and the average gray level in each region of the phantom; and

(d) calibrating the bone mineral density index variation caused by the variation of x-ray radiographic condition.

2. The method as claimed in claim 1, wherein the phantom includes a region having different thickness of M (at least 2) in number and the correlation equation is expressed into the following equation (6) using a continuous function satisfying H(G,0,0)=0.

$$\eta = H(G, A-A_0, B-B_0, C-C_{0,\ldots}) \qquad (6)$$

(wherein η is the amount of variation in the bone mineral density index of the object, G is the bone mineral density index of the object, A, B, C... are the average gray levels in the regions having different thickness of M in number in the phantom region, A_0, B_0 and C_0 are the average values obtained by performing X-ray radiography N times and averaging A, B, C... obtained

from each of the images in the regions having different thickness of M in number in the phantom region)

3. The method as claimed in claim 2, wherein M is 2 and the continuous function is a function expressed into the following equation (7).

$\eta = c_1 G(c_2(A-A_0)-(B-B_0))$ (wherein c_1 and c_2 are constants) (7)

4. The method as claimed in claim 1, wherein the phantom is made from acrylic polymer, styrene polymer, polyethylene, polypropylene, polyester polymer, polyamide polymer or polyurethane polymer.

5. The method as claimed in claim 1, wherein the bone mineral density index in the step (b) is calculated by the steps of:

setting a background trend by interpolating the gray level profiles of nearby soft tissue regions into the object region;

removing the background trend from the gray level in the object region; and

setting the average of the gray level in which the background trend is eliminated from the object region as the bone mineral density index.

6. The method as claimed in claim 5, wherein the bone mineral density index is expressed into the following equation.

$$G = \frac{1}{A} \sum_{l} \sum_{n=b_l}^{c_l} G_{ln}, \qquad A = \sum_{l} |b_l - c_l|$$

(wherein G_{ln} is the gray level profile from which the background trend is eliminated, n is an index of the pixel, l is a row index in the bone region, b_l and c_l denote the start pixel and the end pixel of the bone region in the row l, respectively, A is an area of the bone region, and G is the bone mineral density index).

7. A recording medium readable by a computer, on which a program for executing the method of calibrating the variation in the bone mineral density index written in claim 1 is stored.

8. A recording medium readable by a computer, on which a program for executing the method of calibrating the variation in the bone mineral density index written in claim 2 is stored.

9. A recording medium readable by a computer, on which a program for executing the method of calibrating the variation in the bone mineral density index written in claim 3 is stored.

10. A recording medium readable by a computer, on which a program for executing the method of calibrating the variation in the bone mineral density index written in claim 4 is stored.

11. A recording medium readable by a computer, on which a

program for executing the method of calibrating the variation in the bone mineral density index written in claim 5 is stored.

12. A recording medium readable by a computer, on which a program for executing the method of calibrating the variation in the bone mineral density index written in claim 6 is stored.